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DAIRY IMPROVEMENT THROUGH COW TESTING ASSOCIATIONS

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ADVANTAGES OF TESTING

1. Testing Tells Which Cows Are Profitable

There are many herds in which a few of the cows are highly profitable. Frequently the profits from these cows are turned into a loss from the herd as a whole because the rest of the cows in the herd consume as much feed and labor per cow but give little in return for it.

Fig. 1. A Cow Tester at Work

He weighs and tests the milk for production, and finds the cost of feed per cow. The testing way is the highway to success in dairying.

2. Herd Will Get Better Care

Invariably when a man begins testing, his cows get a little more attention, and especially are they better fed. Many men have been surprised to find through cow testing associations how good their cows really were.

3. Good Cows Worth More When Their Production is Known

A herd of good grade dairy cows with records in the Wadena County cow testing association sold at public auction in the fall of 1922 at an average of $25 more per head than cows of similar breeding without records.

4. Young Stock Worth More

The man who knows and thinks will gladly pay a few more dollars for calves from cows of known production. Wise dairymen do not make a guessing contest of the future herd.

5. Testing Hastens Herd Improvement

Heifers can be raised from the highest producing cows. The value of a young bull or heifer must be judged by the records of its ancestors. Without records of production and cost of feed, improvement is retarded. Heifers from the cows with the best production records should be raised and retained in the herd.

IMPROVEMENT THROUGH COW TESTING ASSOCIATIONS

The farmers of Minnesota are at present milking more than 1,500,000 cows, a large number of which are unprofitable and actually kept at a loss. The average butterfat production per cow in Minnesota according to reliable estimates does not exceed 160 pounds annually, yet many cows are producing from 300 to 1000 pounds of fat, as shown by official records and cow testing association reports. Hence it is easily seen that a great many cows are producing less than 160 pounds of fat per year. It is on this group of unprofitable producers that the cow testing association centers its attack.

No one can determine accurately the milk and butterfat production of a cow without weighing and testing the milk at regular intervals. Some dairymen attempt to keep their own records, but on the whole the most satisfactory and in the end the least expensive way of having the work done, is by joining a cow testing association. Thus a record of each individual cow's production, cost of feed, and returns over cost of feed, are obtained at the end of the year without the many troubles and partly completed records so common when the dairyman attempts to keep his own records.

Progress Slow Without Records

According to Professor T. L. Haecker (Agricultural Experiment Station Bulletin 130) the average cow in Minnesota in 1890 produced 128 pounds of butterfat annually. The most accurate data available indicate that in 1920 the average Minnesota cow produced on an average 160 pounds of butterfat annually, showing an increase of 32 pounds of fat per cow equal to an average annual increase of 1.06 pounds, or a gain of 25 per cent in thirty years. Comment on these astounding facts is unnecessary. The need for organized effort to improve the production of the average cow is obvious.

DEVELOPMENT OF COW TESTING ASSOCIATIONS IN MINNESOTA

Co-operative cow testing in Minnesota is of comparatively recent origin. The first association was organized at Albert Lea, December 1, 1910, through the efforts of Professor Theo. Sexauer, agricultural instructor in the Albert Lea Schools, with several local dairymen and with the assistance of F. H. Scribner of the United States Department of Agriculture. Within a year four more associations were organized in the same county, giving that section of the state the distinction of having the first five associations in the state.

Interest in cow testing spread rapidly throughout the state, following the report of results found in the Pioneer association. Not only did the records help in finding the unprofitable cows, but the way was cleared for better care and feeding through information concerning each cow's production gained by a study of the records from month to month.

Dairy improvement begins with the introduction of purebred sires, weeding out of unprofitable cows, and better feeding. It is among the ranks of the common cow that improvement is most needed.

The cow testing association is instrumental in improving low producing herds. A few low producing cows in any herd may make the herd a losing proposition. Weed out the boarders, and feed the remaining cows the way they should be fed and a low producing herd is soon on a paying basis.

Table 1. Growth of Associations in Minnesota

Number in Operation July 1 of Each Year

1911	3	1918	23
1912	7	1919	21
1913	10	1920	19
1914	9	1921	20
1915	11	1922	37
1916	22	1923	55
1917	26		

The main reasons for this rapid growth may be summed up as follows:

1. Dairying has been and continues to be an enterprise that yields safe, sure, and gratifying returns at regular intervals.

2. Keeping records removes the guess and puts dairying on a business basis.

3. It finds the unprofitable cow, encourages better feeding, and increases the selling value of surplus stock from cows having creditable records.

IT TAKES TWO AVERAGE COWS TO EQUAL THE PRODUCTION OF ONE COW IN TESTING ASSOCIATION

	Average cow in Minnesota	C. T. A. cow 4936 records	Per cent increase
Yearly production of milk, lbs.....	3750	6725.0	79.3
Yearly production of butterfat, lbs.....	160	262.6	64.1
Value of butterfat at 40 cents per lb.....	$64	$105.40	64.6
Estimated yearly feed cost.....	$34.51	$44.87	30.0
Return over feed cost.....	$29.49	$60.53	105.2

EVERY FARMER WHOSE MAJOR INCOME IS DERIVED FROM THE SALE OF DAIRY PRODUCTS NEEDS A COW TESTING ASSOCIATION

1. In order to discover the unprofitable cow. Several such animals in a herd eat up the profits made on the good cow.

2 Because just as much time and effort is required to feed and milk a poor cow as a good one.

3. To encourage systematic feeding methods.

Unlimited numbers of cows are capable of nearly doubling their production when supplied with the proper kinds of feed and fed according to the production of the individual cow.

If all the cows in the United States were divided into two groups, the good cows in one and the poor ones in another, the good cows, if properly fed and cared for, would produce as much milk as all the cows are producing at the present time.

The problem of improvement in dairying is one that needs the closest attention of those engaged in the dairy business. The purebred

sire campaigns so successfully launched in Minnesota will improve the herds in the years to come. One of the problems immediately before us is that of feed, care, and management that will result in the highest production possible with the cows now in production.

Feeding and breeding go together. One without the other leads to discouragement. Both combined and practiced judiciously stand as a monument to the efforts of those who have been successful in handling dairy stock.

Some Notable Results Obtained from Testing

Nine herds tested continuously since 1911 in the Pioneer Cow Testing Association, Freeborn County, Minn., show an increase in 1920 of 40.3 per cent in both milk and butterfat production.

	1911	1912
Number of herds	9	9
Average milk per cow, lbs.	5962	8350
Per cent gain in milk production	....	40.3
Average fat test	4.08	4.08
Average fat per cow, lbs.	243.8	341.4
Per cent gain in butterfat production	....	40.3

Another example from the Pioneer Cow Testing Association illustrates the striking results which follow systematic record keeping.

	1910-11	1920
Number of cows	455	835
Average milk per cow, lbs.	4731	7252
Average fat test	4.0	4.0
Average per cow, lbs.	189	290
Per cent gain in butterfat production	....	53.5

Testing Put Dover Dairymen to the Front*

	1917	1922
Number of herds	10	10
Average milk per cow, lbs.	4824	6791
Per cent gain in milk	....	40.6
Average fat test	3.99	3.82
Average fat per cow, lbs.	191.8	259.9
Per cent gain in butterfat	....	35.5

* The ten herds taken for the 1922 average were owned by the same men in 1917.

What Proper Feeding Did in the Blue Earth Cow Testing Associations

	1920	1921
Average milk per cow, lbs.	7120	8500
Per cent gain in milk	....	19.5
Per cent fat test	4.00	4.05
Average fat per cow, lbs.	285	345
Per cent gain in butterfat production	....	21

In making his annual report the tester in charge of the association said, "I attribute the gain of 60 pounds of butterfat per cow to the better care and feeding of the last year. The majority of the cows were fed a grain ration the year round, thus keeping up the production during the summer months."

The records of a few herds selected from hundreds in Minnesota where increased production has been secured through the influence of a cow testing association are shown in Table II.

TABLE II

	Year	No. cows	Av. lbs. milk per cow	Percentage of fat test	Av. lbs. fat per cow	Percentage gain in fat production
Herd A.....	1911	13	5,530	4.0	226	....
Pioneer CTA...	1920	15	7,732	4.6	359	58.8
Herd C.....	1911	19	6,258	4.4	275	....
Pioneer CTA....	1920	16	7,721	4.9	378	37.4
Herd I.....	1921	23	5,057	4.6	237	....
Plainview Elgin CTA.....	1922	24	5,770	4.7	270	13.9
Herd M.....	1921	17	9,072	3.5	318	....
No. Hennepin...	1922	17	10,751	3.4	366	15.1

The two cows, Queen and Mary, were in the same herd. A yearly record and feed cost showed that it took nearly one-half of the profit from the good cow to keep the poor one in the herd.

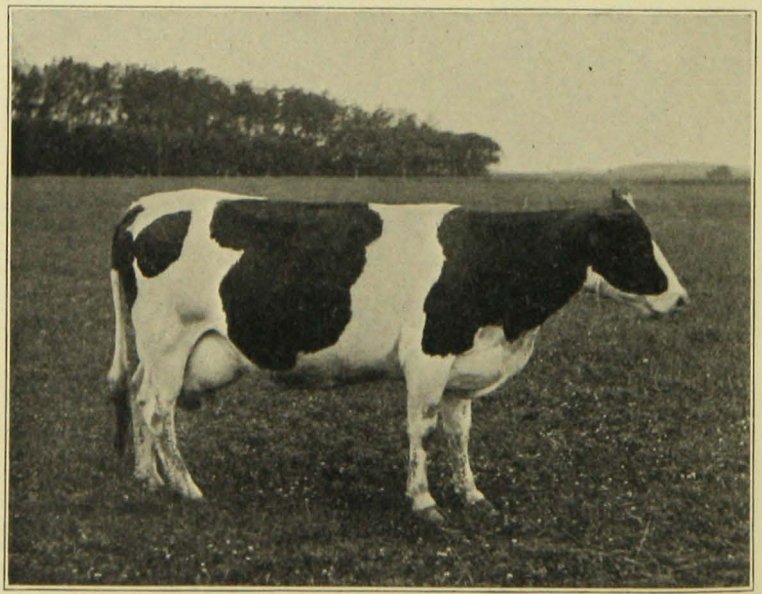

Fig. 2. Queen produced 365.3 pounds of fat worth $171.69 at a feed cost of $49.50, leaving a gain of $122.19.

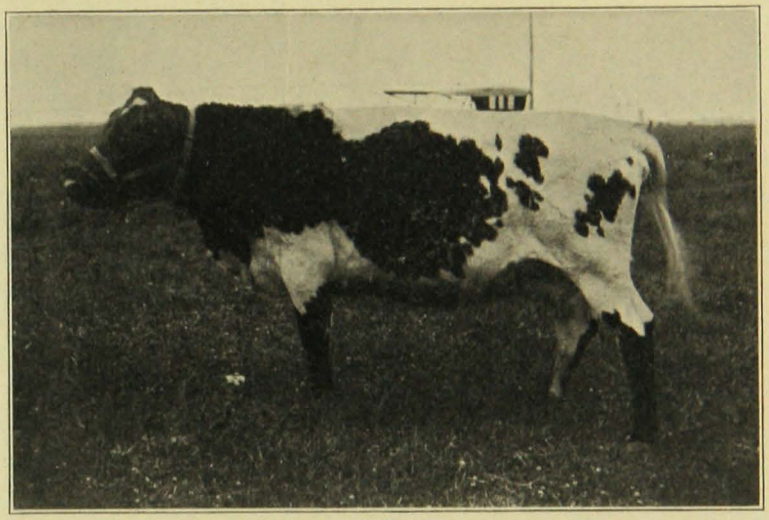

Fig. 3. Mary produced 84 pounds of fat worth $41.95 at a feed cost of $49.40. Loss $7.55 on feed alone.

The performance of grade cows in the testing association demonstrates the value of purebred sires in dairy improvement.

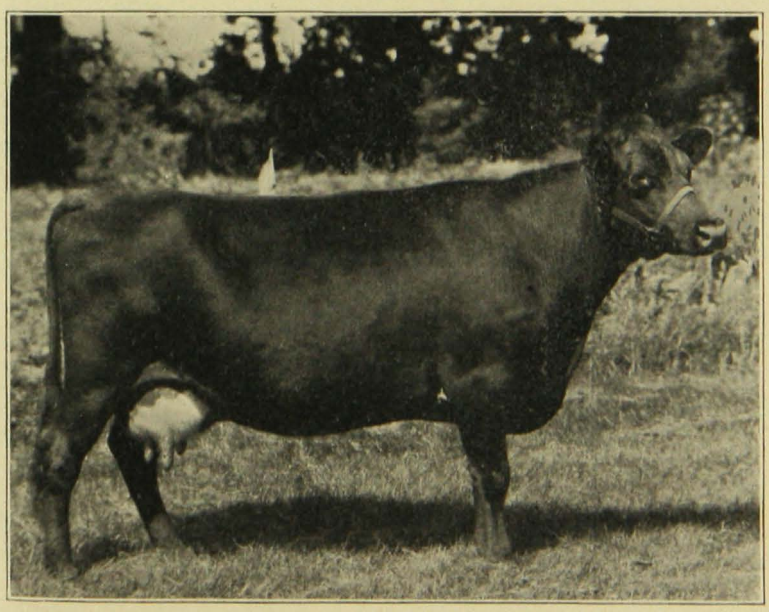

Fig. 4. Molly 2nd, a grade Guernsey owned by Victor Stiehl of Albert Lea, Minn., has an eight-year cumulative record of 3779 pounds of butterfat. The first record of 288 pounds of fat was made in 1911. In the following years she produced, 372, 434, 460, 495, 613, 509, and 608 pounds of butterfat, or an average of 472 pounds for each of the eight years.

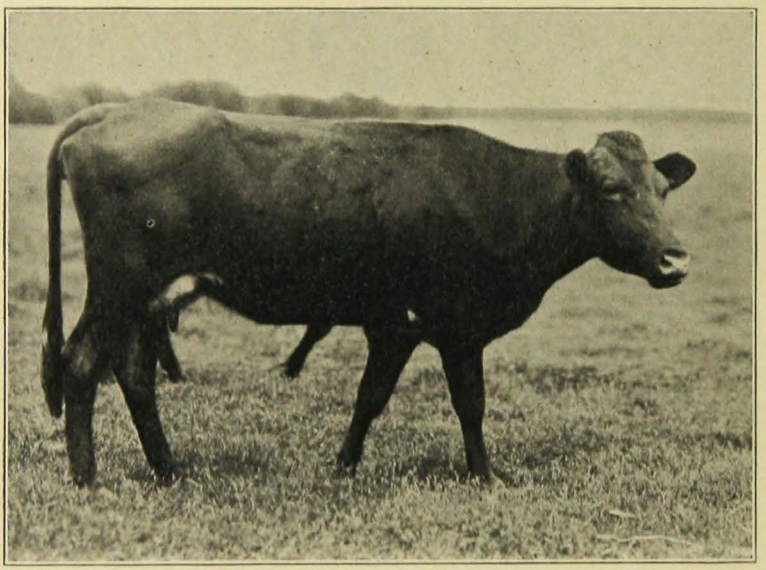

Fig. 5. The dam of Molly 2nd was a common cow of no particular breeding, with two yearly records of 104 and 168 pounds of butterfat, respectively.

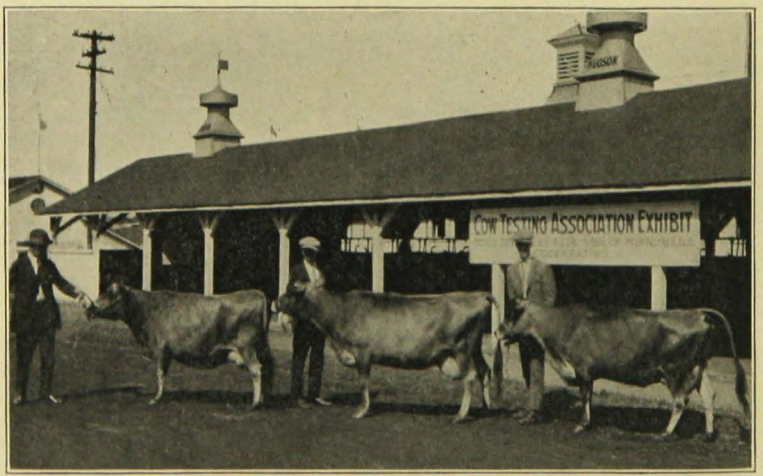

Fig. 6. Three grade cows sired by "Lodster," a purebred Jersey. Average yearly butterfat produced 427 pounds. The yearly average of their dams was 238 pounds of butterfat.

Too many good sires go to the shambles before their value is known. When George Christison, of Plainview, Minn., joined the testing association he found the daughters of his former herd sire "Lodster" exceeding the production of their dams by more than 100 pounds of butterfat.

During the autumn of 1922, when Mr. Christison desired to dispose of a part of his herd, buyers were eager to pay a premium for his cows because they had demonstrated their ability to produce.

Relation Between Yearly Butterfat Production, Cost of Feed, and Returns Over Cost of Feed

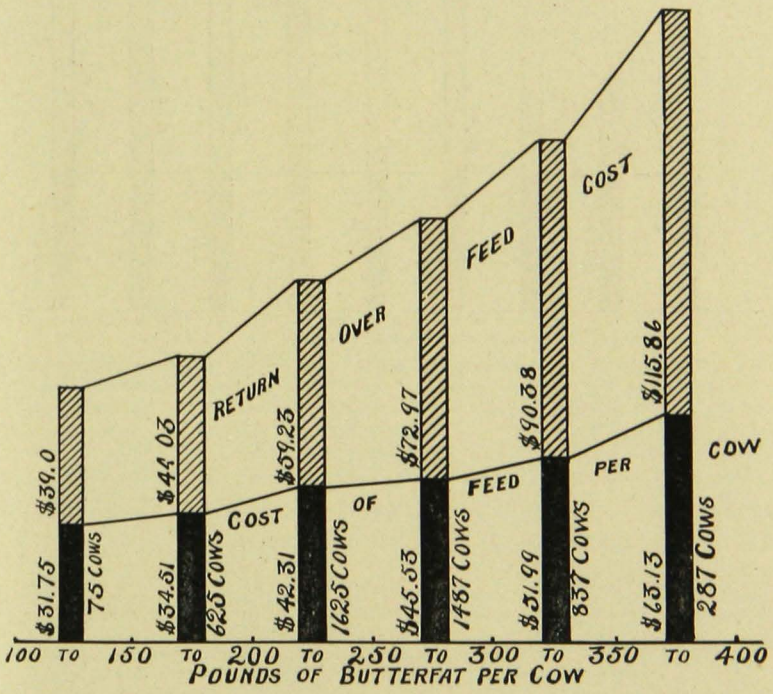

Fig. 7. High producing cows show greater earning power than low producers. A tabulation of 4993 yearly records shows that as butterfat production increased from 100 to 400 pounds there was a regular increase of about $15 in income and $6 in cost of feed per cow for every 50 pounds of increase in average production of butterfat.

Pasture Plus Grain Increases Profits

High producing cows are unable to consume a sufficient amount of grass to meet the requirements for maintenance and production. The sudden drop in the flow of milk so commonly noticed in midsummer is not due altogether, as believed by many, to flies and extreme heat, but rather to a lack of feed, in other words plain starvation. It is doubtful if cows well along in their lactation period or naturally low producers will increase sufficiently to warrant much grain in addition to pasture. Special reference as regards grain feeding while on grass is made to high producing cows and to those coming fresh in spring and early summer.

Relation between Yearly Butterfat Production per Cow and Returns Above Each Dollar Expended for Feed

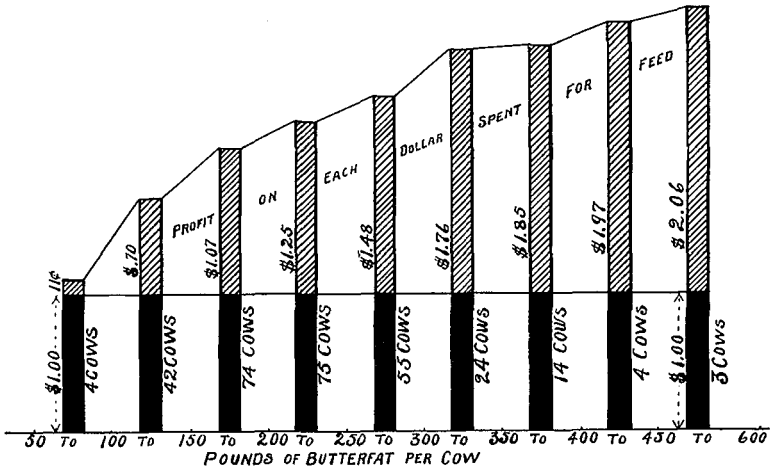

Fig. 8. Range of returns above each dollar expended for feed from 295 cows tested in the Meeker County cow testing association in 1922. As production of butterfat increased from 50 to 582 pounds per cow, the returns above each dollar expended for feed increased from 11 cents to $2.06.

When cows return $1 or more above each dollar's worth of feed consumed, the problem of marketing crops is solved, for the dairy cow on the farm is then one of the best market mediums.

TABLE III

Comparison of Production of Cows Fed Grain in Addition to Pasture and Those Given Pasture Only*

Pasture and grain Group 1			Pasture only Group 2		
No. cows	Av. feed cost	Av. lbs. fat	No. cows	Av. feed cost	Av. lbs. fat
572	$49.35	296.4	1231	$41.87	228.4

* From yearly cow testing association summaries.

Did It Pay?

Feed cost, Group 1	$49.35
Feed cost, Group 2	41.87
Added grain increased feed cost	$7.48
Difference in butterfat production, pounds	68
Value of butterfat at 40 cents per pound	$27.20
Subtracting increased feed cost	7.48
Gain per cow	$19.72

Suggested Rations Increase Production

The cow testing association helps its members to practice right methods of feeding. Production may be considerably increased without a proportionate increase in cost in many herds by providing the

proper feeds in sufficient quantities to meet the cow's requirements for maximum production.

TABLE IV

	Lake Pepin CTA. Wabasha Co. 20 cows		Pine County CTA. 11 cows	
	Before using balanced ration	After using balanced ration	Before using balanced ration	After using balanced ration
	Nov. 1921	Dec. 1921	Nov. 1921	Dec. 1921
Total milk, lbs.....	11,920	14,060	6126.3	8459.0
Increase in milk, lbs...	.....	2,140	.....	2332.7
Increase in butterfat,lbs	.....	83.3	.....	85.9
Value of increase.....	.....	$38.39	.....	$38.65
Cost of feed for herd.	$29.52	$42.17	$15.40	$27.48
Net gain above feed for Dec. over Nov...	.....	$25.74	.....	$25.57

Silage, Legumes, and Grain Assist in Maximum Economical Production

Silage

The cow that must eat dry, unpalatable corn fodder or stover does not fill the pail. Silage, like pasture grass, stimulates milk production, increases vigor, and aids digestion.

Legumes

Without legume hay the most satisfactory results are well-nigh impossible. Two very essential constituents for milk production, **protein** and **lime**, are found abundant in clovers and alfalfa.

In the Meeker County Cow Testing Association, cows that were fed legume hay produced 2086 pounds more milk annually than cows fed common non-leguminous hay, such as ordinary upland and timothy.

Grains

If silage and legume hay are not provided, economical winter production of milk and butterfat can not be hoped for. Farm-grown grain crops such as corn, barley, and oats meet the requirements quite satisfactorily for herds averaging not more than 250 pounds of fat annually when silage and legume hay are provided. Bran is recommended in the ration for its stimulating and laxative properties. In the absence of legumes, if high production is to be maintained, considerable quantities of linseed meal and cottonseed meal must be provided. This will materially increase the cost of producing a pound of butterfat. By changing from a poor ration not fed according to production, to one providing more **protein** and fed at the rate of one pound of grain to each 3 to 4 pounds of milk produced, a member of the Pine County Cow Testing Association increased the production of his herd of 11 cows

2332 pounds of milk in one month. (See Table IV.) A comparison of cow testing association records shows that production is increased when some grain is fed during the summer, especially when the pastures get short and do not provide enough feed to maintain production. Testing associations show an annual average increase of 68 pounds of butterfat per cow in favor of feeding grain in summer. (See Table III.)

HIGH PRODUCING GRADE COWS ARE IN DEMAND; FIND THEM THROUGH THE COW TESTING ASSOCIATION

To be profitable, grade cows must be able to produce large quantities of milk and butterfat, as grade sires have no value, and grade females from the standpoint of financial returns do not begin to compare with purebreds.

Profitable dairying for the average farmer is essentially a question of having grade cows of a high standard of production, for every one is not especially adapted to be a breeder of purebred cattle.

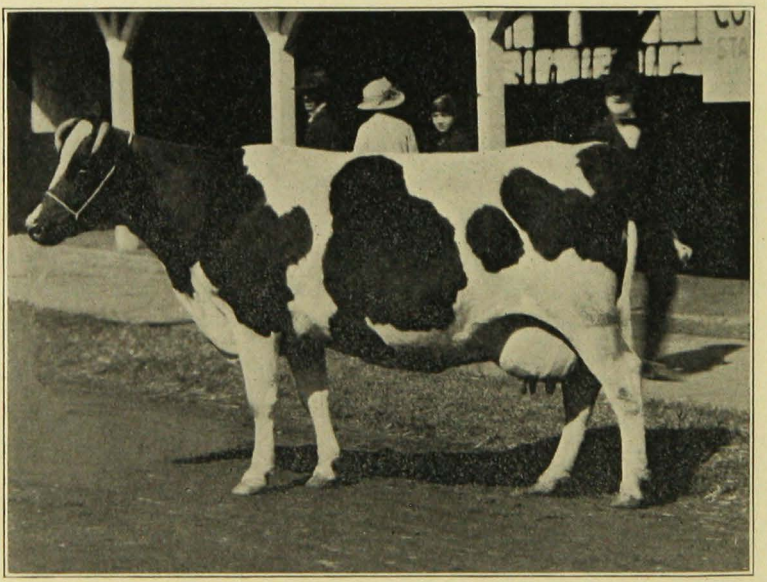

Fig. 9. "Bones," a grade cow found in the Blue Earth County Cow Testing Association. Yearly record, 22,367 pounds of milk, 760 pounds of butterfat. The highest producing cow in Minnesota cow testing associations.

Breeding, as Well as Feeding, Counts

Two herds in the Progressive C. T. A., New Richland, Minn., illustrate the effect of good breeding. Twelve cows in herd A were equal to 24 cows in herd B.

	No. cows	Average lbs. milk	Percentage test	Average lbs. fat	Feed cost	Gain above cost
Herd A.....	12	8,601	3.88	335.2	$49.35	$89.89
Herd B.....	12	5,441	3.68	200.3	49.92	35.00

Herd A is composed of 12 high-grade Holsteins, the result of using a well-bred sire.

Herd B is composed of 12 scrub and common cows, showing no particular breeding, but a predominance of dairy conformation.

The fact that the feed cost per cow for herd B is greater than for herd A makes these comparisons the more important from the standpoint of placing a definite value on the improvement noted where better breeding is found.

Inherited low production established through generations of scrub ancestry may be entirely changed though a few generations of grades from sires bred for production. Frequently the opinion is held that a common herd does not warrant the investment in a good purebred sire. It is in herds of this sort that good blood tells the quickest. Increase in butterfat production comes with comparative ease and rapidity up to 300 pounds annually. After that point is reached each succeeding generation will have a smaller increase over the previous one, as compared to the first and second generation grades.

The present demand and prices received for high-grade dairy cows is an index to their importance from the standpoint of production in the dairy industry.

Fig. 10. Jenny produced 454 pounds fat in a year, leaving $139.70 gain over feed cost. Nora produced only 140 pounds fat, that left but $14.67 above feed cost. She is not a bad sort of cow to look at, but she lacks the inherent ability as well as the capacity to handle large quantities of feed for milk production.

A good cow soon pays for herself. A poor cow brings her owner another mortgage. There is a pride and satisfaction associated with the ownership of good stock that can not easily be attained through any other enterprise on the farm.

ORGANIZING THE TESTING ASSOCIATION

The most common way of organizing a cow testing association is to make a preliminary survey in the community of the interest in dairying, the number of cows kept, and the general sentiment toward cow testing association work.

The next step is to call a meeting of those interested at the most convenient point. Such meetings are usually called at the request of the county agent or by a group of dairymen interested in testing. The Agricultural Extension Division of the University of Minnesota is always willing to assist with such work. In the majority of cases a few days of individual soliciting among prospective members is necessary to secure the 26 required members. As a final step in the organization a meeting is called for those who have signed the year's contract to test. The purpose of this meeting is to elect officers and two directors. The officers are a president, vice-president, secretary, and treasurer. The officers and directors constitute the governing board of the association.

The business transacted at the first meeting is in general as follows:

1. Election of officers.
2. Fixing the date for the work to begin.
3. Discussion of method of securing dues from members.
4. Authorizing the purchase of a testing outfit.
5. Fixing wages to be paid tester.
6. Considering applications for tester.

Agreements and Forms

The plan of organization proving the most satisfactory in Minnesota is the "day plan," in which each member pays a fixed fee for each day of the tester's services, regardless of the number of cows, up to thirty. The advantage of the day plan is that each member will enter all his cows in the test, thereby getting the greatest benefit from the association.

The ideal association is composed of 26 herds, as this number keeps the tester busy all the working days in a month.

In order to make the collection of dues as easy and simple as possible, they are made payable to the treasurer of the testing association by means of pre-dated checks. These are made out for the quarterly dues of each member, the first check dated for the time the work starts, the three remaining checks are dated the fourth, seventh, and tenth

months after the date of the first check. The checks used for this purpose are furnished to those who plan to organize cow testing associations.

Cost of Testing

The salaries paid to testers vary considerably, but at present the wages in Minnesota range from $50 to $80 per month. His experience and qualifications determine largely the salary paid. The cow tester obtains free board and room from the members.

The expense to each member is reduced to the lowest possible rate that will furnish sufficient funds to hire a competent tester and purchase the necessary equipment.

The monthly basis of organization charging a fixed fee per herd has proved the most satisfactory. All but three associations in Minnesota are now operating with entire satisfaction on this basis.

With the present wages of testers and cost of equipment a fee of $3 to $4 per month is charged each member, where at least 26 members can be secured. Membership agreement blanks may be secured from the Agricultural Extension Division, University Farm, St. Paul, Minn.

Qualifications of a Tester

The success of an association rests almost entirely upon the shoulders of the tester in charge. He should have some special training and possess a personality that will allow him to adapt himself readily to varying environments. The most important requirements are punctuality, regularity, and accuracy. Unless he has these qualifications his records may not be a true indication of the cow's production.

The tester should have sufficient training and practical experience in feeding dairy cows that he may advise members intelligently on feeding for maximum economical production through balanced rations and the proper selection of feeding stuffs.

In order not to leave the impression that the tester is the only factor in the success of the association, it is well to mention the part the member plays, as well. Testers are looked upon by many as individuals who never should make mistakes. Remember mistakes are human shortcomings. Too frequent errors can not be tolerated, but, on the other hand, sympathetic co-operation of members with the tester in correcting errors will go a long way in making a successful association.

Members who never study their herd books or make changes in feeding methods as suggested by the tester are nearly always the ones who are the least enthusiastic about testing and usually their conclusions are that testing and keeping records has not been of any special value to them, and that they have learned nothing that they did not already know.

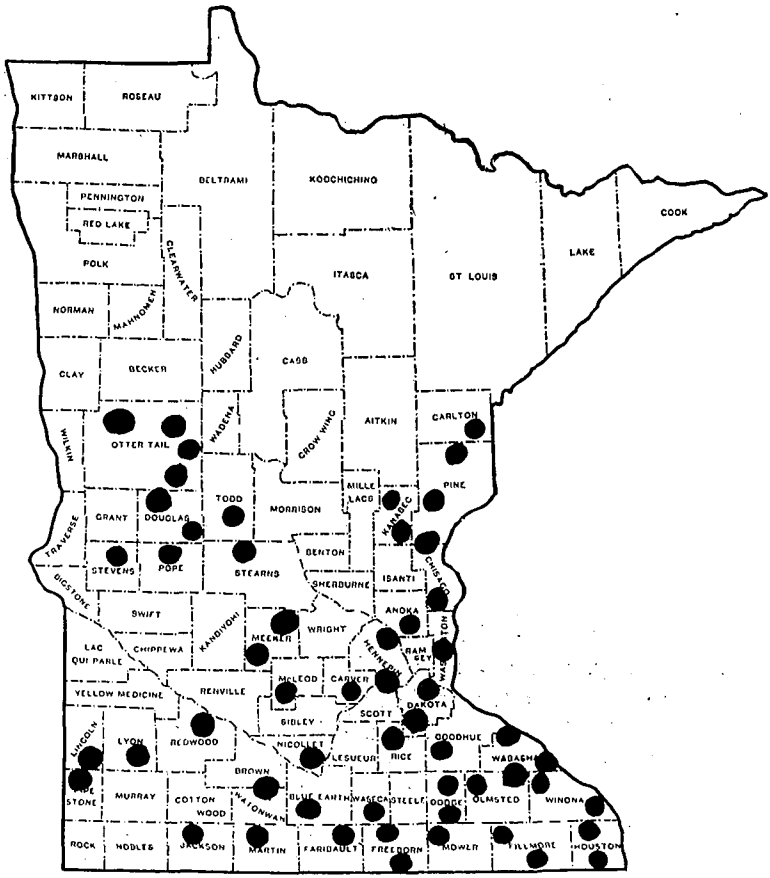

Fig. 11. Testing Associations in Minnesota

Each dot on the map represents the location of a testing association, July 1, 1923. One out of every hundred dairy cows in Minnesota is on test in cow testing associations. With one out of every three cows unprofitable, more testing associations are needed to weed out the boarder cows. The result will be a higher standard of production, and an annual income such as every dairy farmer is entitled to.